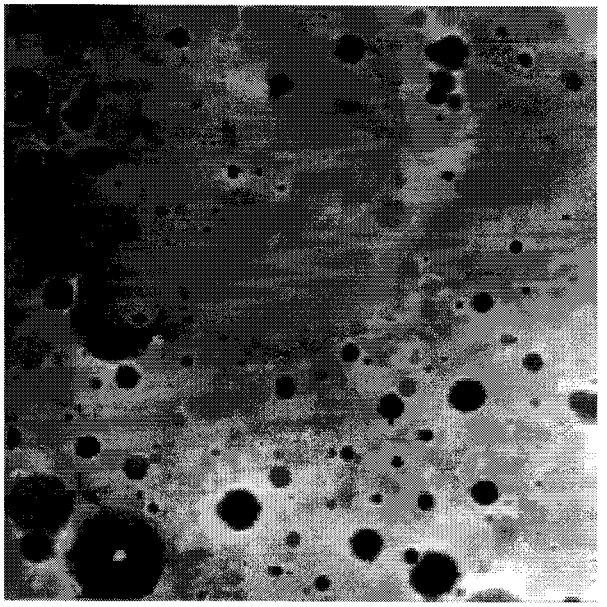
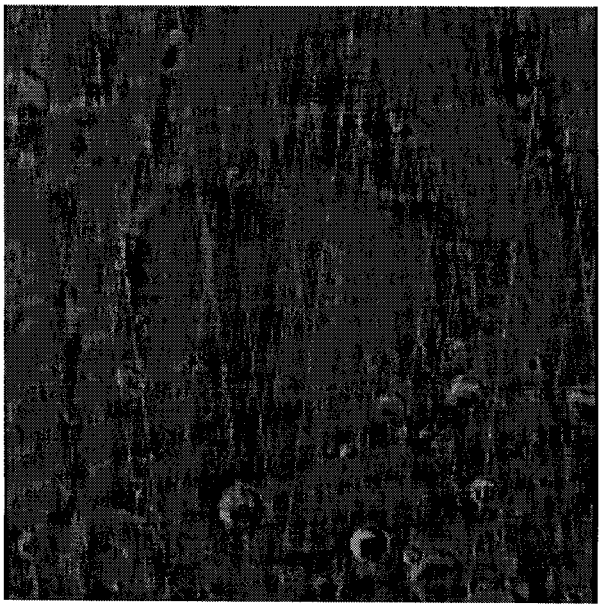
MOLA-BASED LANDING SITE CHARACTERIZATION. T. C. Duxbury and A. B. Ivanov, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 91109, tduxbury@jpl.nasa.gov and Anton.B.Ivanov@jpl.nasa.gov,

The Mars Global Surveyor (MGS) Mars Orbiter Laser Altimeter (MOLA) data provide the basis for site characterization and selection never before possible. The basic MOLA information includes absolute radii, elevation and 1 μm albedo with derived datasets including digital image models (DIM's – illuminated elevation data), slopes maps and slope statistics and small scale surface roughness maps and statistics. These quantities are useful in downsizing potential sites from descent engineering constraints and landing / roving hazard and mobility assessments. Slope baselines at the few hundred meter level and surface roughness at the sub-meter level are possible.

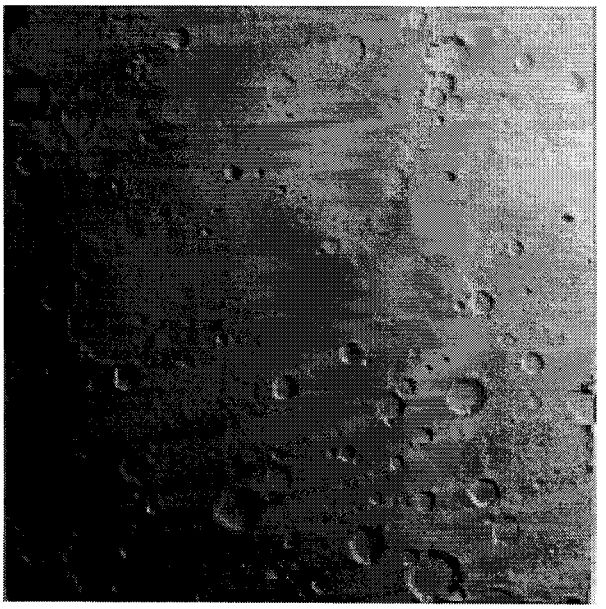
Additionally, the MOLA-derived Mars surface offers the possibility to precisely register and map project other instrument datasets (images, ultraviolet, infrared, radar, etc.) taken at different resolution, viewing and lighting geometry, building multiple layers of an information cube for site characterization and selection. Examples of direct MOLA data, data derived from MOLA and other instruments data registered to MOLA are given for the Hematite area.



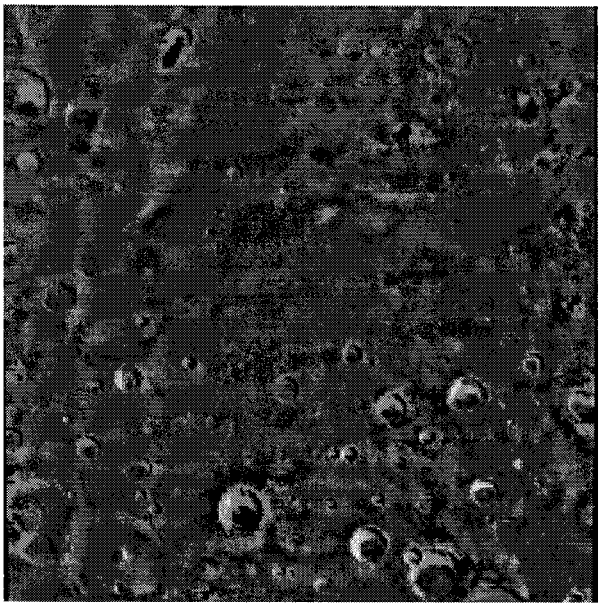
MOLA digital elevation model (DEM) in the Hematite area (~1.3 M MOLA points)



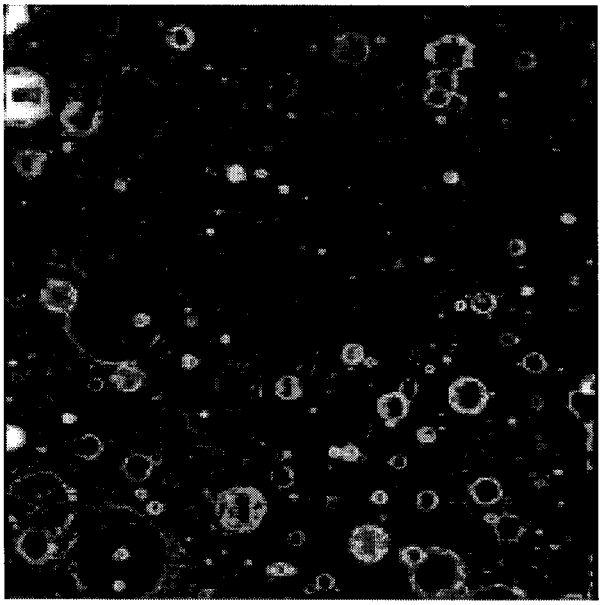
MOLA coverage in the Hematite area (~750 orbits)



Derived digital image model (DIM) in the Hematite area produced by illuminating the MOLA DEM



Map-projected and gridded Viking Orbiter imaging data registered to the MOLA reference surface and coordinates



MOLA-derived Hematite area slope map

Acknowledgement: this work would not be possible without the success of the MGS MOLA instrument provided by Dr. David Smith, Goddard Space Flight Center and the MOLA team. This work was conducted at the Jet Propulsion Laboratory, California Institute of Technology, under contract to the National Aeronautics and Space Administration, Mars Data Analysis Program.